



Dugway Proving Ground Restoration Advisory Board Meeting

May 7, 2007
Dugway Proving Ground
Dugway, Utah

PROJECT UPDATES

Keller Davis - Shaw Environmental, Inc.

- Groundwater Monitoring
 - Post Closure Requirements
 - Ditto and Carr Groundwater Management Areas
- Remediation Activities
 - Landfill Cover Construction
 - Removal Actions



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Groundwater Monitoring



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Post Closure Requirements

- Sites closed with waste-in-place (e.g. landfills) require groundwater management
- Specific monitoring and reporting requirements are contained in Dugway's RCRA Part B permit (Module VII)
- 2006 requirements include sampling at HWMUs 2, 43, and 128



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Post Closure Monitoring

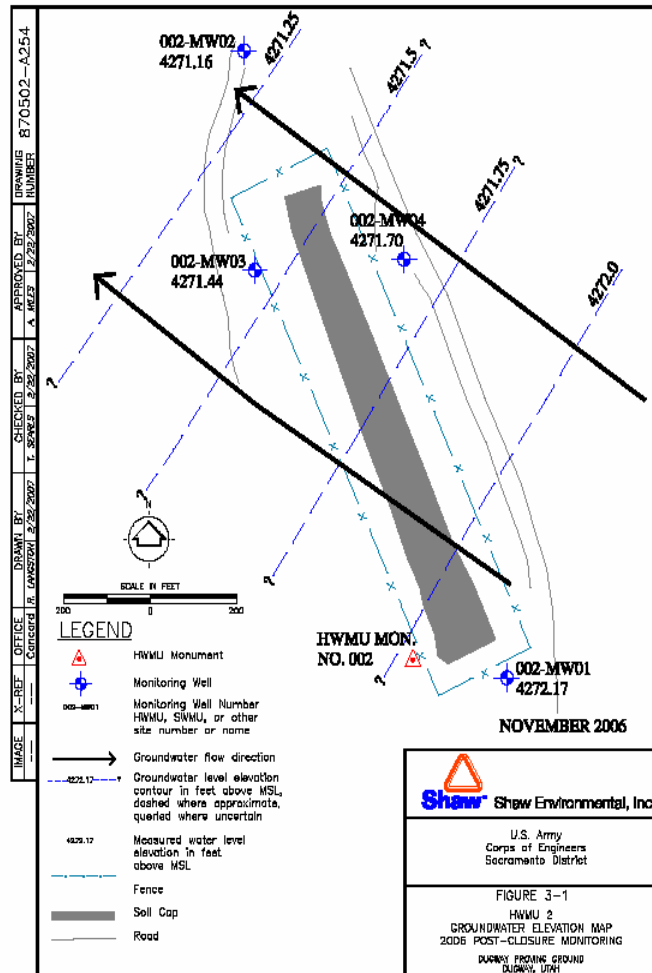
HWMU 2

- Landfill cover constructed in 2003
- Post Closure groundwater sampling biennially
- First event was in 2004
- Second event November 7, 2006
- Analyze for metals, sulfate, TOX



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Post Closure Monitoring



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Post Closure Monitoring

HWMU 2 – Results

- Metals – Arsenic levels increasing in MW02 and MW04
- Sulfate – Decreasing trend
- TOX – Within historic range



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Post Closure Monitoring

HWMU 2 – Recommendations

- No evidence of significant change in groundwater conditions
- Defer future sampling requirements to Downrange GMA plan



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Post Closure Monitoring

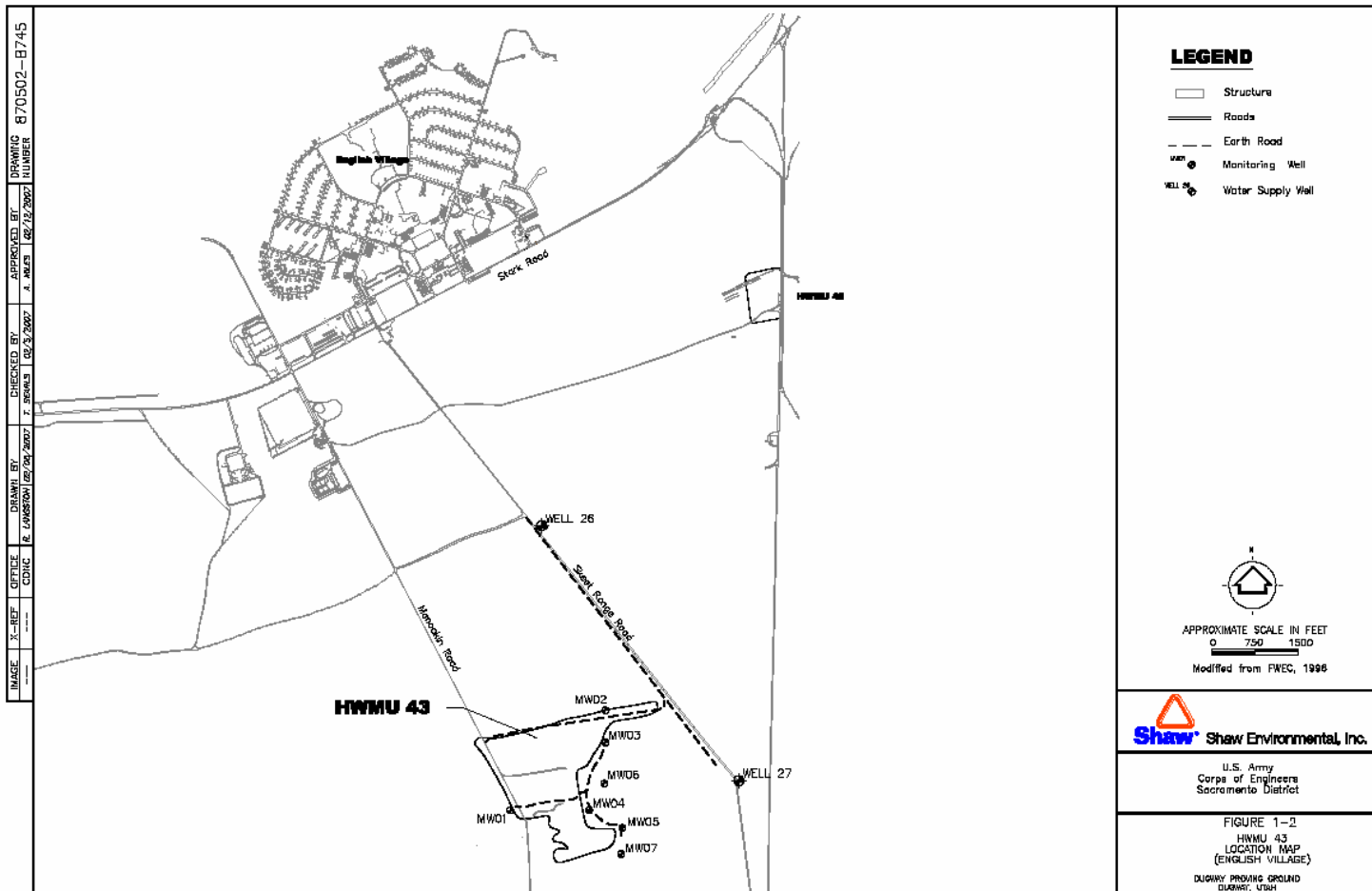
HWMU 43

- 70 acre site in English Village
- Landfill cover constructed in 2004
- Post Closure groundwater monitoring biennially
- First event completed December 4-6, 2006
- Analyze for VOCs, TOX, TOC, metals, nitrate/nitrites, arsenic speciation



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Post Closure Monitoring



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Post Closure Monitoring

HWMU 43 – Results

- Arsenic Speciation – Arsenite (III) v. Arsenate (V)
 - As (III) and As (V) are primary forms of arsenic in environment
 - Sources include: soil weathering, coal burning, ore smelting, pesticide application
 - As(III) more mobile and toxic
 - As(III) only 1% of arsenic detected at HWMU 43



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Post Closure Monitoring

HWMU 43 – Results (cont.)

- Volatile Organic Compounds (VOCs)
 - Seven wells sampled
 - 67 compounds analyzed for in each well
 - Trichlorofluoromethane (Freon 11) was detected in MW02 at 0.27 $\mu\text{g/L}$. Residential remediation goal is 1,300 $\mu\text{g/L}$.



Post Closure Monitoring

HWMU 43 – Results (cont.)

- Metals
 - Detected concentrations similar to historic levels
- Nitrate
 - Detected concentrations similar to historic levels
- TOC and TOX
 - Results within acceptable range



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Post Closure Monitoring

HWMU 43 – Recommendations

- No evidence of significant change in groundwater conditions
- Defer future sampling requirements to English Village GMA plan



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Post Closure Monitoring

HWMU 128

- Former pesticide mixing and storage facility
- Waste removal and Risk-Based Closure in 2004
- One round of groundwater sampling required to validate 1995 results
- Sampling occurred November 9, 2006
- Analyze for VOCs, SVOCs, PAHs, pest, herb, metals



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16

Post Closure Monitoring

HWMU 128 Results

- VOCs – No detections
- SVOCs – No detections
- PAHs – No detections
- Pesticides – No detections



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Post Closure Monitoring

HWMU 128 – Results (cont.)

- Herbicides – Dicamba detected in MW01 at 0.66 $\mu\text{g/L}$. Residential remediation goal is 1,100 $\mu\text{g/L}$.
- Metals – No detections exceeded Utah Maximum Concentration Limits (MCLs)



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Post Closure Monitoring

HWMU 128 – Recommendations

- Results generally agree with 1995 results
- No future groundwater sampling proposed
- Nitrate sampling will be performed per English Village GMA



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Ditto and Carr GMAs

- Objectives
 - Regionalize groundwater management to focus resources on known plumes
 - Monitor known plumes as indicators of environmental impacts
 - Standardize the approach to plume monitoring, resource management, and clean-up objectives



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Ditto and Carr GMAs

- High Frequency Water Levels
 - Prescribed in GMA Plans
 - Collecting water levels in Ditto at 5 wells spread across 3 sites every 15 minutes for one year
 - Objectives:
 - Monitoring seasonal changes in the groundwater mound in Ditto
 - Gain better understanding of communication between shallow and deep groundwater



High Frequency Water Levels



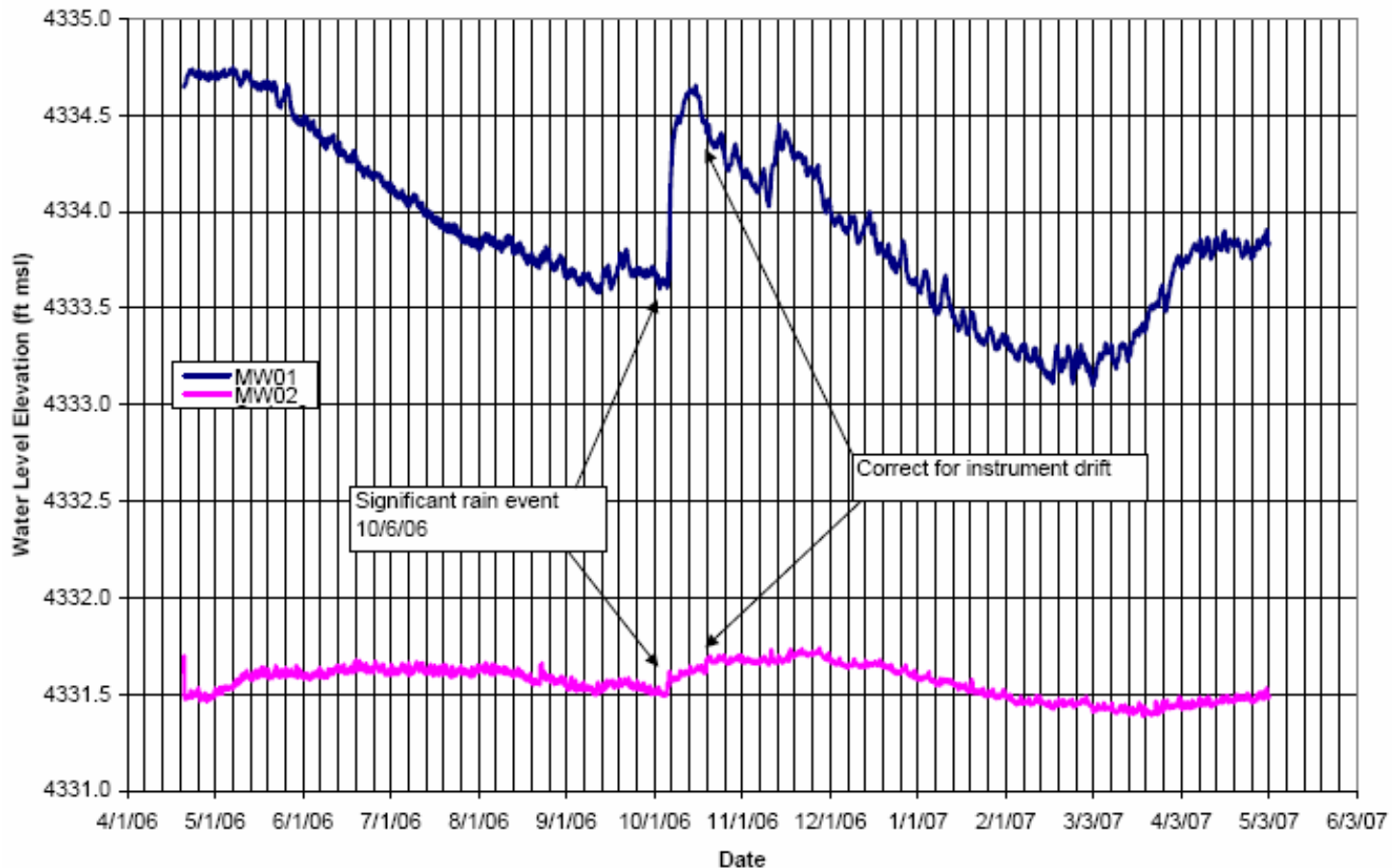
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23

High Frequency Water Levels

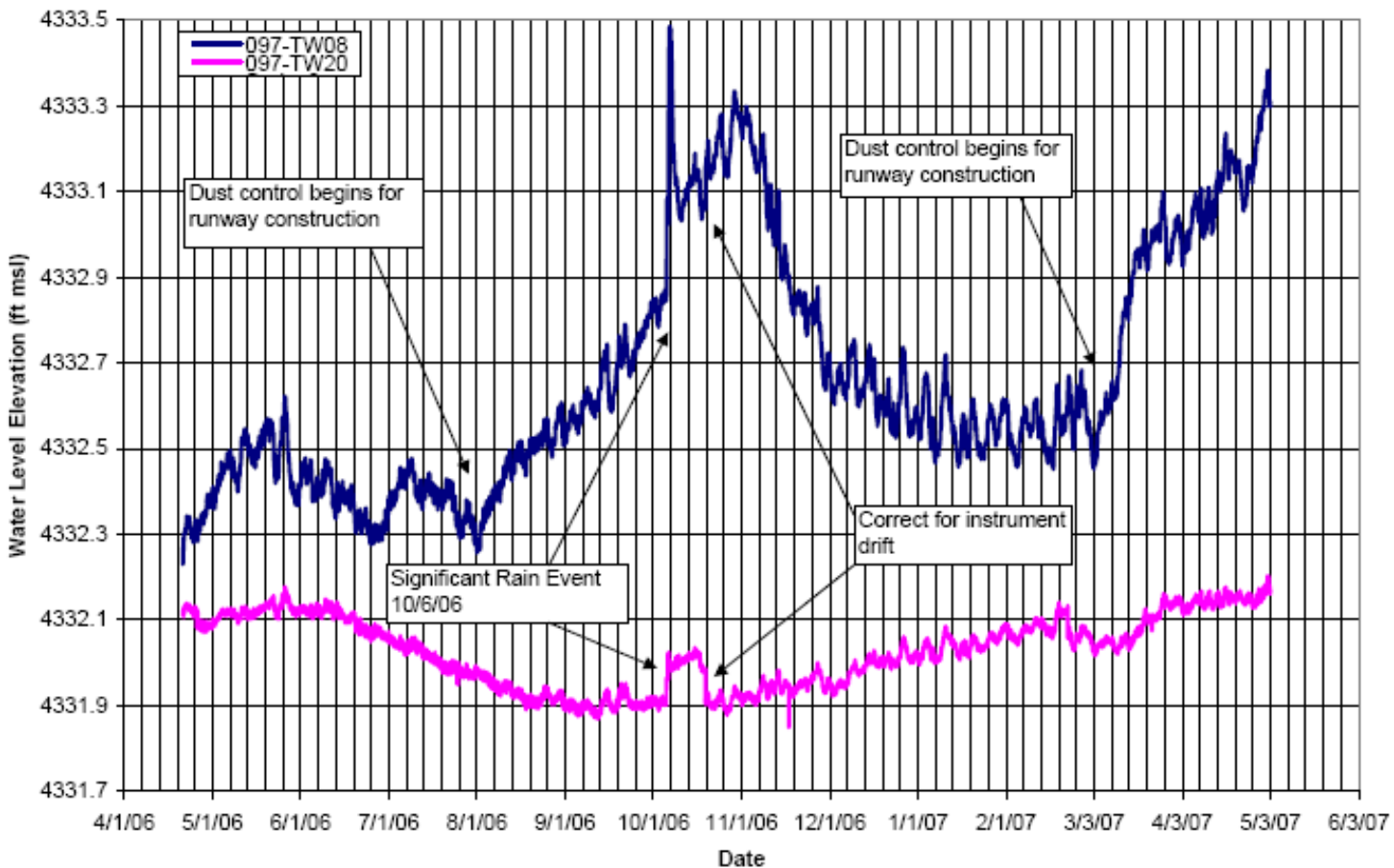
SWMU 177



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High Frequency Water Levels

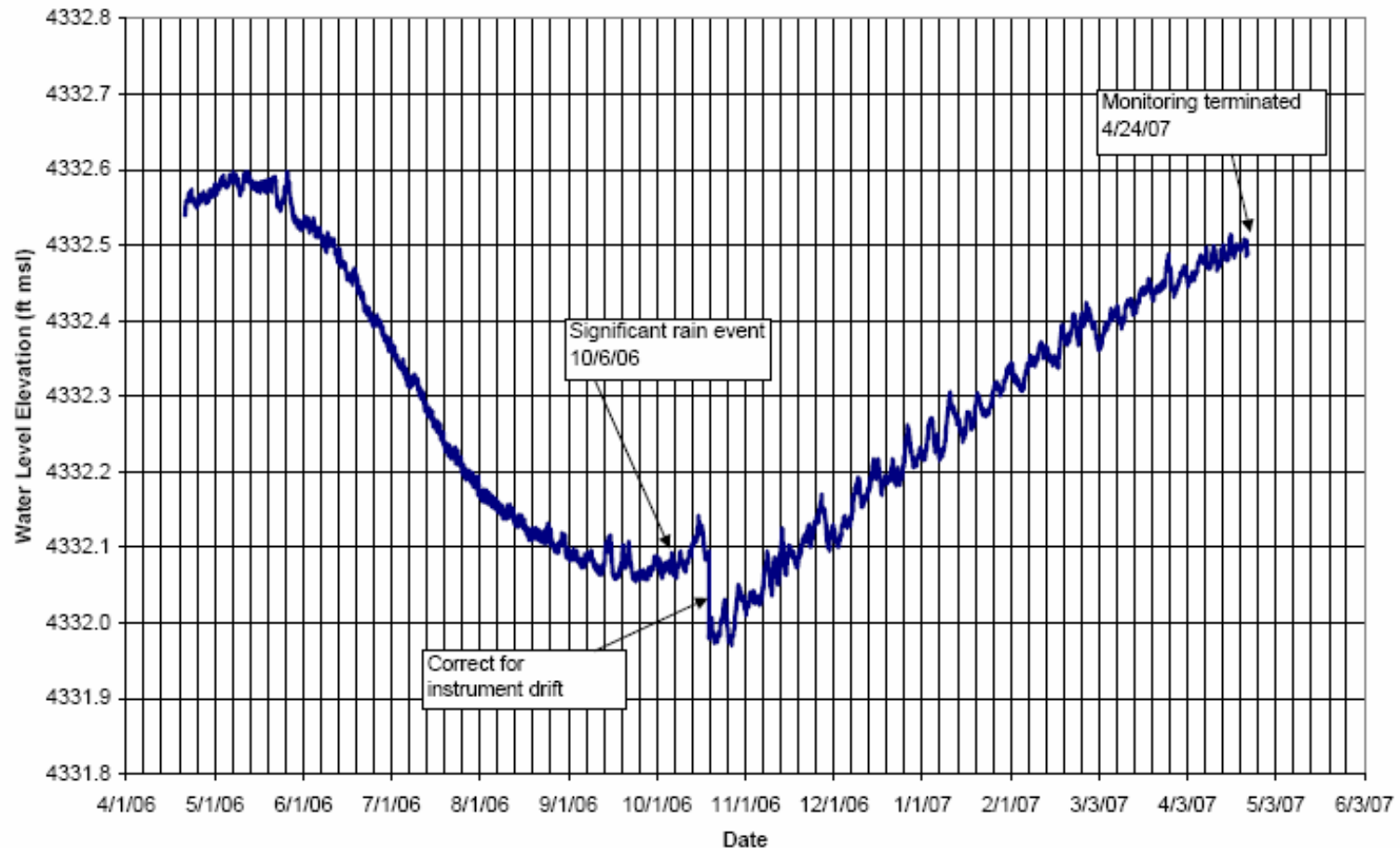
SWMU 97



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High Frequency Water Levels

HWMU 39



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Remediation Activities



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Remediation Activities

Two Remediation Technologies:

- Closure-in-place landfills
 - Safety issues preclude handling the wastes
 - Install geo-membrane supported geosynthetic clay liner (GCL) cover systems and perform routine maintenance
- Removal actions
 - Site history and investigation results support waste removal to attain closure
 - Use sampling to demonstrate waste and exposure risks have been removed



Landfill Cover Construction



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Landfill Cover Construction



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Landfill Cover Construction



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Landfill Cover Construction

- 4 sites planned for 2007: 39, 55, 79, and 197
- Work began April 16, 2007
- Projected completion in July 2007
- Approximately 4 acres of GCL will be deployed



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Removal Actions

- 11 sites planned for 2007: 9, 18, 19, 23, 25, 115, 118, 180, 188, 199, and 212
- Site feature defined during investigation
- Safety assessments show waste is safe to excavate and remove
- Sample waste to determine disposal options
- Excavate and dispose of waste
- Confirmation sampling in footprint of excavation
- Sample results used to demonstrate adequate removal
- Work scheduled to commence in July 2007
- Projected completion in November 2007



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Questions?



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